XIV MIĘDZYNARODOWY KONGRES POLSKIEGO TOWARZYSTWA ALERGOLOGICZNEGO

IL-33 may augment the effect of rhinovirus HRV16 on the inflammatory activity of human lung vascular endothelium – possible implication for rhinoviral asthma exacerbations

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Introduction

Human rhinovirus (HRV) may cause severe asthma exacerbations, which is accompanied by increased airway IL-33 concentrations.

Aim

To analyze the effect of IL-33 on the HRV-induced anti-viral and inflammatory response by the lung vascular endothelium.

Material end methods

Human pulmonary microvascular endothelial cells (HMVEC-L) were exposed to HRV-16 (MOI3) alone or upon the pre-stimulation with IL-33 (10 ng/ml) and cultured for 72 h. HRV-16 copy number in HMVEC-L, cytokine, chemokine and growth factors mRNA expression were assessed in real-time PCR.Protein concentrations were assessed in BioPlex, while ICAM-1 expression in the flow cytometry and confocal microscope.

Results

HRV16 strongly increased the release of inflammatory cytokines, including IL-1β, IL-6, TNF-α, RANTES and IP-10, chemokines: MIP-1α, MIP-1β, IL-8 and eotaxin as well as growth factors: G-CSF, GM-CSF, FGF and VEGF ($p < 0.05$). Furthermore, HRV16 enhanced both mRNA expression and protein release of type I interferons (IFN-β and λ, $p < 0.05$) as well as immunomodulatory cytokines: IL-12, IFN-γ, IL-4, IL-5, IL-13, IL-17 ($p < 0.05$), but not IL-10. IL-33 increased the capture of HRV16 particles associated with the up-regulation of ICAM-1 surface expression ($p < 0.05$). IL-33 enhanced HRV16-

induced release of IL-1β, IL-6 ($p < 0.05$), but not RANTES, IP-10, TNF-α production. IL-33 enhanced HRV16-induced release most of growth factors and chemokines ($p < 0.05$), but not MIP-1β and MCP-1.Finally, IL-33 enhanced HRV16-induced release IL-12 (not IFN-γ), IL-4, IL-5, IL-13, IL-17, and IL-10 ($p < 0.05$).

Conclusions

IL-33 may augment the effect of rhinovirus on inflammatory, but not antiviral, activity of thelung vascular endothelium, and thus facilitate heavy exacerbations of asthma. National Science Center 2017/25/B/ NZ5/01575.